



## DESIGN PRINCIPLES

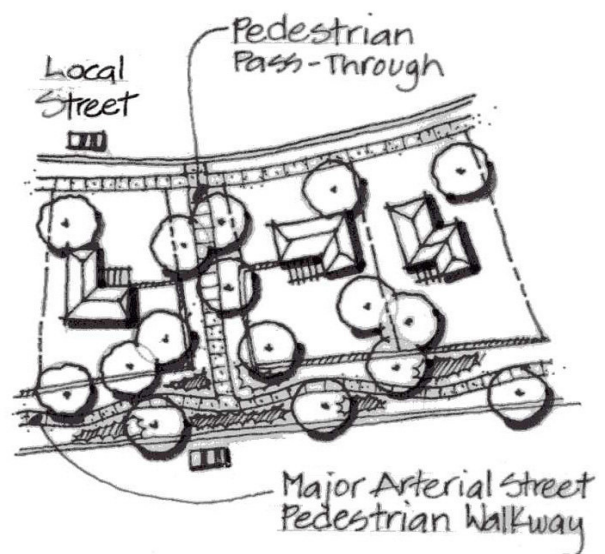
All design projects begin with planning, whether a master planned community or an improved sidewalk connecting existing uses in a downtown area. This category describes planning design principles which are necessary to encourage or allow pedestrian areas to develop or renovate. Concerns such as neighborhood character, scale of development, and decisions that shape infrastructure during the planning phase of a project are discussed in the following sections.

### Connections

**Interconnect pedestrian destinations such as parks, trail systems, transit stations, bus stops, and entertainment.**

The logical extension of improving utilitarian and tourist pedestrian areas is to link them with other areas that receive intense recreational pedestrian use, such as parks, canals, and natural areas. The linkages should incorporate the same concern for pedestrian safety and comfort as a pedestrian area. While the region has taken tremendous strides to create pedestrian connections within and between communities, linkages between pedestrian areas in the MAG region need to continue to be strengthened.

There are many opportunities to create linkages where none are planned or currently exist. Many communities now require 'back doors' between subdivisions and commercial areas that are open during the daytime. This reduces the walk time to service retail uses for nearby residents. Communities are also providing 'pass-throughs'



*Pedestrian connections to pedestrian routes.*

between cul de sacs, perimeter fencing and arterial and collector streets, and adjacent commercial land uses which also encourage walking by reducing trip length.

### **Plan land use according to the 10-minute (0.25 mile/0.4 km) walk rule.**

The 10-minute walk rule is based on research that states most pedestrians will walk up to ten minutes to reach a destination<sup>20</sup>. Ten minutes equates to a one-third to one-half mile walk. In this region, most commercial developments are located at arterial intersections which are spaced one mile apart. Since not all services generally required by the consumer are located in one retail center, it is necessary to fill some service needs at one retail center and then drive to the next to find another service. The development of a compact walking-scale district that is guided by the ten minute walk rule could encourage walking more than providing large, single-use retail developments at the fringes of the community.

Recognizing the 10-minute walk rule provides a framework for planning pedestrian areas. Shopping areas where walking is desired should locate most, if not all, development within an area that is up to one-half mile wide. Combined parking areas could be located up to one-quarter mile apart as opposed to surrounding the buildings, enhancing the safety and quality of the pedestrian environment. Rear lot pass-throughs between residential areas and commercial uses should be provided to shorten the distance a pedestrian needs to walk from home to shopping. Openings in perimeter walls should be provided to reduce the walk between home and transit stops.

This concept is also appropriate for infill and redevelopment projects because it encourages

a more compact and efficient use of existing land and infrastructure.

Another way to implement the 10-minute walk rule is through mixed use or new urbanist development. These developments recognize that people can live, work and play within a relatively compact environment. It uses the concept of 'stacking' land uses; for example, placing residential or office development over retail uses creates a sense of activity and excitement at the street level. New urbanist development is based on a charter that describes the variety of developments and factors it considers<sup>21</sup>.

Developments that implement the 10-minute rule and support transit are called *transit oriented development* (TOD). TOD is development that occurs within 1/2 mile of a transit stop, is linked to a network of walkable/bikeable streets, contains a rich mix of uses - retail, residential, workplace and has appropriate treatment of parking and densities appropriate to its setting<sup>22</sup>.

The 10-minute rule also applies to community design. Residents should be able to walk no more than ten minutes to a neighborhood park, retail center, or transit stop.

### **Provide walkways adjacent to roadways, but separate from the curb whenever possible with landscaping, a bicycle lane, or on-street parking.**

The regional arterial street system is an arterial and collector street grid system. Most retail and employment development, community facilities, and destinations are located along the arterial and collector grid. Because many arterial streets provide sidewalks that meet some minimum safety standards, the arterial grid system is useful as a transportation corridor for pedestrians. This design

---

<sup>20</sup> (Guide for the Planning, Design and Operation of Pedestrian Facilities, AASHTO. June 2004.)

<sup>21</sup> (<http://www.cnu.org/aboutcnu/index.cfm?formAction=charter>.)

<sup>22</sup> (<http://www.reconnectingamerica.org/html/TOD/index.htm>)



*Parked cars provide a buffer for pedestrians.*

principle encourages enhancing the safety and comfort of these pedestrian facilities by separating the sidewalk from the roadway. Often, this separation can be accomplished without sacrificing other safety considerations, such as providing median refuges, by narrowing or removing lanes, adding bicycle lanes or on-street parking.

In addition to separating pedestrians from the roadway, walkways should be provided during the initial development of a road. Because this region is developing quickly, often development is not contiguous. As a result, as development occurs, there are often gaps in the walkway. A pedestrian travelling from one development to another is consequently forced onto the roadway in areas between developments with no sidewalk or pedestrian walkway. To address this, walkways should always be provided adjacent to all roadways. These walkways can be stabilized surfaces or a paved path, but they must be designed to be separated from the roadway and safe.

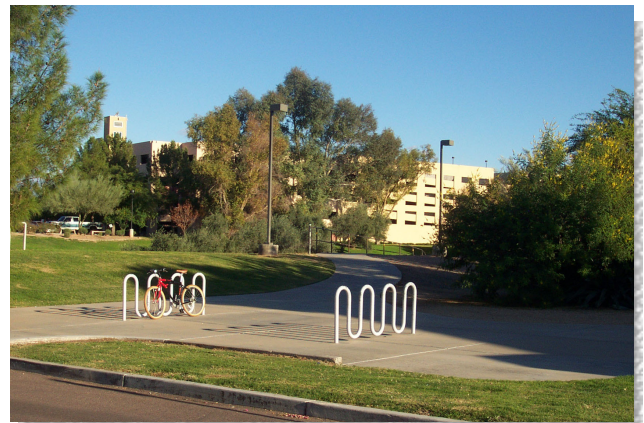
**Design master planned communities and subdivisions as a collection of multiple smaller neighborhoods, interconnected by a pedestrian and bicycle network.**

Within the mile grid of the regional transportation system rests a myriad of subdivisions and master planned communities. Each of these developments

can be designed around or include centrally located public facilities such as schools, parks, churches, and shopping. These public facility cores should be linked with safe pedestrian facilities to the surrounding residential areas.

**Connect the pedestrian system with safe and comfortable facilities to other non-motorized and public transportation systems, taxi service, and airport shuttles.**

Once a bicycle ride or trip on public transportation ends, users become pedestrians until they reach a final destination – be it home, car, work, or other location. By connecting the pedestrian network to other regional systems it makes it easier for people to transition between bicycles, busses, and walking, thereby lessening auto dependence.



*The entrance to the library is near the greenbelt.*

**Recognize and maintain access to off-street opportunities for safe and comfortable pedestrian facilities including canals, washes, rivers, and alleys.**

The MAG region is fortunate to have an excellent and widespread system of canals, washes, rivers, and alleys that can provide alternate, secondary and unique experiences for pedestrians. These features provide an excellent location for safe and comfortable pedestrian facilities. Some of



these features traverse existing and planned commercial areas and provide additional opportunities for destination facilities for pedestrians.

### **Pedestrian Places**

**Encourage people to walk by creating places that use land use, destination pedestrian facilities, and economic and cultural activities to establish walking as a primary or secondary activity.**

Creating places where walking is encouraged as a primary or secondary activity will attract people who want to walk and will encourage others who may come to that location for another reason, to also walk. These places can be created by locating cultural institutions such as museums in core areas within walking distance of one another and encouraging sidewalk vendors such as newsstands, food and craft carts to supplement existing retail or fill-in vacant spaces between land uses.

Another way to get people outside of their immediate destination is to make the surroundings interesting. This can be done by establishing and reinforcing the existing character of an area and its surroundings through special district Codes, Covenants & Restrictions (CC&R's), and distinctive landscaping. Establish cohesive architectural guidelines to guide site development and site planning. Use street trees, architectural lighting, signs, furnishings, and accent paving along the pedestrian routes to establish and emphasize a theme. Celebrate the cultural aspects of an area through interpretive signs, festivals, farmer's markets, parades, art fairs or other events.

### **Traffic Calming**

**Use techniques to enhance the awareness of pedestrians by vehicular drivers.**

If a driver is moving more slowly, they have more time to understand and interpret the surrounding environment. For example, a driver of a slower moving vehicle has more time than the driver of a fast-moving vehicle, to see a ball enter a street and anticipate that a child or dog may follow it, or to anticipate someone crossing mid-block.

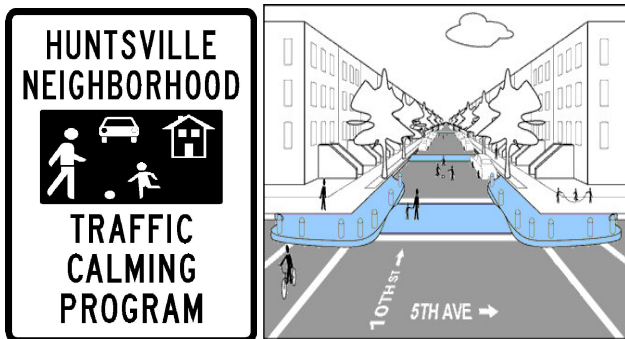
The concept of traffic calming, or methods to slow traffic, has been developed over the past 30 years. These techniques have been used extensively in England, Germany, and the Netherlands to reduce speed, accidents, noise, pollution, and congestion. Traffic calming techniques have also made neighborhoods more livable. Adaptation of these techniques to U.S. cities where vehicular use is higher is most common on the West Coast. While most people are familiar with speed humps, other techniques have also been developed such as channelization (used to separate intersecting, diverging, merging, weaving, and turning movements), slow streets, transit street, speed tables, traffic diverters (that prevent certain through and turning movements), corner radii reduction (which reduces the area within which



*Speed tables slow traffic.*



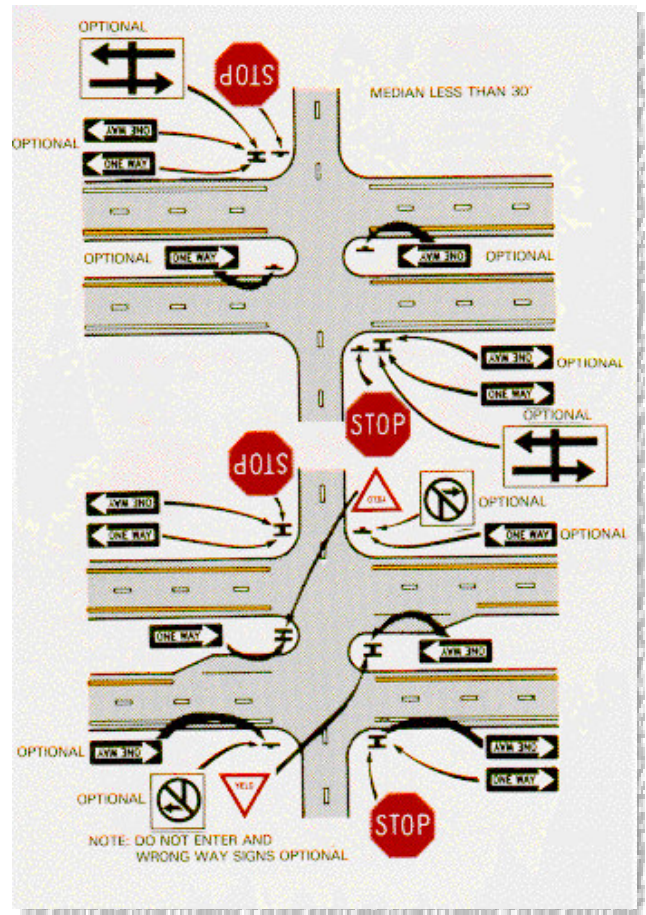
Chicanes. (<http://www.rolog.ch/images/realisation/P103.JPG>.)



Slow Streets is a programmatic approach using a variety of techniques to slow traffic through a neighborhood. These images show using speed humps and curb bulb outs to reduce traffic speeds. (<http://www.transalt.org/campaigns/nsn/images/10thand5thbrooklyn.gif>)



Curb radius reduction in Linden, Ohio. (<http://linden.morpc.org/images/modifiedint2.jpg>.)



Traffic Channelization. (<http://www.ctre.iastate.edu/educweb/ce352/lec05/channel.gif>.)



Traffic Tables. (<http://www.students.bucknell.edu/projects/trafficcalming/Library/Raised%20XWbig.jpg>).





Traffic Diverter in Sarasota Florida. (<http://www.sarasotagov.com/InsideCityGovernment/>.)

a car can turn the corner, hence requiring a slower speed to complete the turn), chicanes (used to narrow the street and create choke points), traffic circles, and signing improvements.

Traffic calming is most helpful at improving safety and improving residential and shopping environments and directly reduces the speed of vehicles through physical improvements. Use of these techniques should be a part of an established hierarchy in the street system.

However, traffic calming is not the sole solution to managing traffic for the benefit of pedestrians and neighborhoods. Prior to installing these types of devices, data collection to determine traffic volumes and speeds should be collected to determine if they will be effective. In addition to impacting through-traffic, traffic calming techniques also impact local residents driving habits. These impacts must be evaluated in terms of who will be affected and if the benefits from traffic calming justifies the local inconvenience it may cause.

### **Provide pedestrian crossing signs or other features at unexpected crossing areas to increase driver awareness.**

Pedestrians cross where it is most convenient. Sometimes the most convenient location is unsafe because it is unexpected by or not highly visible to a moving vehicle. While there is still debate regarding if the pedestrian should be accommodated or not at undesired crossings (the thinking is that any amenities will encourage pedestrian



Pedestrian barriers are used in London to prevent mid-block crossings. ([http://safety.thwa.dot.gov/ped\\_bike/univcourse/swless23.htm](http://safety.thwa.dot.gov/ped_bike/univcourse/swless23.htm).)

crossing where it is not desired), these guidelines recommend where pedestrian crossings are desired, provide signs, striping, pavement textures or other signals to drivers to make them more aware of their environment. This will also enhance pedestrian safety and provide facilities to make the crossing attractive to the pedestrian. Where pedestrian crossings are not desired, discourage the pedestrian by using signs and/or barriers (such as fencing or horizontal separation) and alert drivers through techniques such as signs, changes in pavement texture, and lighting that pedestrians may cross unexpectedly. It should be noted that any proposed traffic control devices need to meet the warrant criteria of the MUTCD.

## **Landscape**

### **Use native, drought tolerant plants and landscape areas wherever possible to soften the hard edges of the built environment and increase pedestrian comfort.**

Convert drainage areas and odd lots adjacent to pedestrian areas and nodes in to small landscaped spaces. Residents or adjacent business owners can be encouraged to plant and maintain street trees or provide other shade elements. Landscape

should only be provided if there is a commitment to its long term maintenance.

### **Minimize the amount of unused or dead space within the pedestrian environment.**

Spaces between buildings, vacant lots, obsolete or vacant buffer areas or median strips reduce the safety, comfort, and destination aspects of a pedestrian environment. Examine the pedestrian environment for areas that can be developed into active spaces that enhance the pedestrian experience. For example, vacant lots and spaces between buildings or remainder areas of right-of-way provide the opportunity to create pocket parks and plazas that foster social interaction among pedestrians and can provide a resting place and a respite from the built environment.

## **Site Planning**

### **Establish separate pedestrian routes within a site and between sites to reduce walking distances and enhance pedestrian safety.**

Reducing barriers between sites and land uses can reduce the distance walked by pedestrians. Often pedestrians must use the street and walk around a wall or landscaping that is placed on property lines to prevent through vehicular traffic.



*This vacant corner was turned into an active plaza through the use of landscaping, benches, and kiosks.*

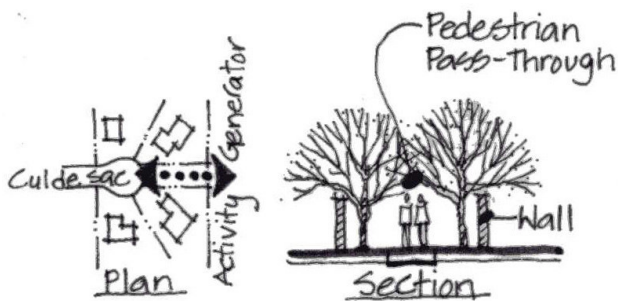
Because pedestrian facilities often follow roadway facilities, pedestrians are required to walk additional distances to entrances that are primarily designed for vehicular safety. Providing diagonal access for pedestrians at street corners into commercial, employment, office, and public land uses that are not blocked with walls or landscaping can reduce the distance of the pedestrian trip. Within a site, internal pedestrian circulation systems that are separated from those designed for vehicles can help to avoid vehicle/pedestrian conflicts. On larger sites, or in corridors where several pedestrian areas are connected, implementing a shuttle service should be considered to reduce the distance of pedestrian trips.

### **Develop safe, shared-use path systems along washes, canals, utility corridors, alleys, in the spaces between buildings and along other linear ways.**

Planning walkways along these features increases the number of loops or opportunities within the pedestrian network system. These features also provide for areas where the pedestrian can be separated from vehicular traffic. It is important to note that these areas are sometimes isolated or may only support low intensity pedestrian activity. To keep these areas safe and secure, keep them visible to the occupants of the buildings on the site and consider foot patrols, cameras, lighting, and emergency phones along the routes.

**Provide easements at cul-de-sacs to link pedestrian areas with activity generators and transit stops. In gated or walled communities, establish pass-throughs with lockable gates at ¼ mile (0.4km) intervals to destinations such as other residential areas, transit stops, parks and trails, and neighborhood shopping.**

Cul-de-sacs are appealing to subdivision designers because they create a sense of safety and security from traffic. Coincidentally, this often results in a circulation network that is inconvenient and unworkable for pedestrians. Providing pedestrian pass-throughs at cul-de-sacs will enhance pedestrian mobility and contribute to a more walkable community. See *Reconsidering the Cul-De-Sac* by Michael Joseph and Eren Ben Joseph, April 2004, for more information on this topic.



Pass-throughs provide pedestrian access.

### **Locate primary retail entrances adjacent to pedestrian routes along the street with parking behind or to the side of the building.**

Connecting destinations to places where people walk will enhance the potential for pedestrian activity. Instead of separating entrances from pedestrian areas (such as sidewalks, plazas, parks, and transit stops or stations) by parking areas, locate retail entrances close to places where people walk.

## **Architectural Design**

### **Design buildings and places that are human scaled.**

Tall buildings with large entrances, windows placed above a pedestrian's line of sight, and ornamentation that is larger than a person all make people feel

smaller. When a space is too large to understand or control, people begin to feel unsafe. Appropriately scaling buildings to a person can enhance their feeling of size and safety. This can be done by providing a high proportion of openings (windows and doors) in the building facade, as opposed to blank walls. Provide transparent windows that block the sun while allowing the passerby to see inside the building. In retail areas, entrances to stores should be no more than 35 feet apart with display windows between entryways to reduce blank walls and add light and vitality to the street.

## **Signs**

### **Design signs, first, to provide information and directions, and second, to create a thematic or design character function.**

Provide directional signs to guide the public to pedestrian areas from transportation systems such as transit routes, freeways, and airports. Provide for out-of-state and international visitors and tourists by using an international sign marking system. Within pedestrian areas, use signs to guide pedestrians to features and amenities such as restrooms, public phones, public plazas, and major destinations. In these locations, sign design should reflect and strengthen a local design theme or character.

## **Bicycle**

### **While this document focuses on the pedestrian, bicyclists often use the same areas and need to be acknowledged.**

Bicycles travel at faster speeds than pedestrians. While they are much more maneuverable than motorized vehicles, bicycles still need adequate stopping and maneuvering distances to help them avoid unanticipated pedestrian activity. Strive to place bicyclists and pedestrians on separate





This sign in Judiciary Square, Washington D.C. provides extensive information on area sights and wayfinding. (<http://www.azasla.org/articles%202002/images/Washington%20402.jpg>.)

safe, facilities. If a separate facility is not provided for bicyclists, increase the width of the pedestrian area to a minimum of 10 feet to allow adequate room for the bicycle safely to pass a pedestrian. However, on-street or separate bicycle facilities should be provided in areas that have wide sidewalks to accommodate high levels of pedestrian activity. Provide convenient bicycle parking areas that do not interfere with pedestrian activities or routes. Provide bicycle racks or lockers at convenient locations adjacent to major destinations, commercial, office, and retail centers.

**Where shared-use pedestrian/bicycle access is adjacent to, but not in conflict with, pedestrian routes or corridors, provide a minimum 10-foot wide shared-use pathway.**



These bicycle racks are provided outside of the pedestrian right-of-way adjacent to a building entrance.

Wide shared-use pathways reduce the potential for conflicts between bicycles and pedestrians. For shared-use pathways, AASHTO recommends a minimum of 10 feet.

### Transit Interface

**Locate transit stops adjacent to walkways at 1 mile (1.6 km) intervals in rural areas, and 1/2 mile (0.8 km) or less in developed areas on arterial streets.**

Because they are more difficult, split mode trips (trips requiring more than one transportation mode) are less desirable than single mode trips. By placing transit stops within walking distance of people and connecting people to them with safe and comfortable facilities, the potential for combining a car and a transit trip is reduced. This may include pedestrian easements between gated communities and transit stops.

**Design transit centers to be pedestrian friendly.**

To reduce auto trips, it is key to make intermodal transfers between bus and light rail seamless, safe, and comfortable. One way that this can

be done is to co-locate bus stops and bus terminals with light rail stations, minimizing the distance that a traveler needs to walk between these two travel modes. Additionally, locating these transit centers in areas where other services are nearby can further reduce trips by enabling the rider to conveniently attend to errands or shopping needs without having to make a separate trip.

### **Maintain visual connections from the light rail platform to exits, connections to other modes, and potential destinations.**

In our region, light rail stops are raised platforms located in the middle of the right of way. They are accessed from crosswalks at the intersection. Once exiting the train, the traveller is a pedestrian. Visual connections between the platform and destinations, other modes of transportation, and the station will help the pedestrian to more quickly understand the environment, and make them feel safer and more comfortable.

### **Change paving textures and color to signal light rail platform entrances and edges.**

Pedestrians with low vision may have trouble identifying exactly where the mid-street entrance to a station is located. Changes in paving texture can assist by providing another cue that denotes an entry into the station. Refer to ADAAG guidelines for further information.

### **Use barriers and signs to alert drivers and pedestrians that only designated entries are safe to access the rail platform.**

This principle addresses the potential that someone who wants to get to the station more quickly will cross mid-block and 'jump' onto the platform, potentially getting caught between the train and oncoming traffic.



*This light rail station is planned at Campbell and Central Avenues in Phoenix, Arizona. (<http://www.valleymetro.org/rail/StationDesign/1Campbell%20and%20Central%20Avenue.html#TopOfPage>.)*